

Patent claims

1. A plastic object for use in personal hygiene, comprising at least two parts of different plastic materials, wherein the two parts of the plastic object are formed by at least two molded parts (2, 4; 32, 34) consisting of different plastic materials (A, B) which do not bond with one another during the injection-molding operation and are joined to one another in particular by a non-positive and/or positive fit.
2. The plastic object as claimed in claim 1, wherein the plastic object is a toothbrush (1; 1') and the one molded part (2; 32) is a toothbrush part bearing a brush head (3) and the other molded part (4; 34) is a toothbrush part forming at least part (6) of a handle.
3. The plastic object as claimed in claim 1 or 2, wherein, for forming a non-positive, firm fit between the two molded parts (2, 4; 32, 34), the one molded part (2; 32) is at least partially enclosed by the other molded part (4; 34) in a kind of shrink fit.
4. The plastic object as claimed in one of claims 1 to 3, wherein a positive fit is formed at least on part of the surface where the two molded parts (2, 4; 32, 34) touch by parts (10, 11; 16, 17; 22, 23; 22', 23'; 40, 41) of the two molded parts (2, 4; 32, 34) engaging in one another.
5. The plastic object as claimed in claim 4, wherein the positive fit is formed by projections (10, 17, 22, 22', 40) on one molded part (4; 34 and 2; 32, respectively) and recesses (11, 18, 23, 23', 41) on the other molded part (2; 32 and 4; 34, respectively) engaging in one another.
6. The plastic object as claimed in one of claims 1 to 5, wherein the plastic materials (A, B) have a different degree of shrinkage.
7. The plastic object as claimed in one of claims 1 to 6, wherein at least one of the two molded parts

(2; 32 and 4; 34, respectively) consists of two or more plastic components of which at least one cannot be bonded with the plastic material (A or B) of the other molded part (4; 34 and 2; 32, respectively).

5 8. The plastic object as claimed in one of claims 2 to 7, wherein the one molded part (2; 32), which forms the toothbrush part bearing the brush head (3), consists of polypropylene and the other molded part (4; 34) consists of styrene acrylonitrile.

10 9. The plastic object as claimed in one of claims 2 to 7, wherein the one molded part (2; 32), which forms the toothbrush part bearing the brush head (3), consists of polypropylene and the other molded part (4; 34) consists of acrylonitrile-butadiene styrene or
15 polyamide or polycarbonate or polyester.

264
20 10. A method of producing a plastic object as claimed in one of claims 1 to 9 by means of injection molding, wherein one of the molded parts (2; 32 or 4; 34) is injection-molded from a first plastic material (A or B) in a first step and the other molded part (4; 34 or 2; 32) is subsequently injection-molded from a second plastic material (B or A), which does not bond with the first plastic material during the injection-molding operation, in a second step.

25 11. The method as claimed in claim 10, wherein, with the different degree of shrinkage of the two plastic materials (A, B) intended for the molded parts (2, 4; 32, 34), that molded part (4; 34 or 2; 32) which is produced from plastic material (A or B) with the
30 lower degree of shrinkage is injection-molded in the first step.

35 12. The method as claimed in one of claims 10 or 11, wherein, in the production of a toothbrush (1; 1'), the molded part (4; 34) forming at least part (6) of a toothbrush handle is injection-molded from styrene acrylonitrile in a first step and the molded part (2; 32) bearing the brush head (3) is subsequently injection-molded from polypropylene in a second step.

AMENDED CLAIMS

[received at the International Bureau on May 3, 2000
(05.03.00); original claims 1-12 replaced by new claims
1-10 (3 pages)]

- 5
1. A toothbrush comprising a first molded part (2; 32), having a brush head (3), and a second molded part (4; 34), forming at least part of a handle, the two molded parts (2, 4; 32, 34) consisting of different plastic materials, wherein the two molded parts (2, 4; 32, 34) are formed from different plastic materials (A, B) which do not bond with one another during the injection-molding operation and wherein, for producing a non-positive, firm fit between the two molded parts (2, 4; 32, 34), the one molded part (2; 32) is at least partially enclosed by the other molded part (4; 34) in the manner of a shrink fit.
- 10
2. The toothbrush as claimed in claim 1, wherein a positive fit is formed at least on part of the surface where the two molded parts (2, 4; 32, 34) touch by parts (10, 11; 16, 17; 22, 23; 22', 23'; 40, 41) of the two molded parts (2, 4; 32, 34) engaging in one another.
- 15
3. The toothbrush as claimed in claim 2, wherein the positive fit is formed by projections (10, 17, 22, 22', 40) on one molded part (4; 34 and 2; 32, respectively) and recesses (11, 18, 23, 23', 41) on the other molded part (2; 32 and 4; 34, respectively) engaging in one another.
- 20
4. The toothbrush as claimed in claim 1 ~~one of claims 1 to 3~~, wherein the plastic materials (A, B) have a different degree of shrinkage.
- 25
5. The toothbrush as claimed in claim 1 ~~one of claims 1 to 4~~, wherein at least one of the two molded parts (2; 32 and 4; 34, respectively) consists of two or more plastic components of which at least one cannot be
- 30
- 35

bonded with the plastic material (A or B) of the other molded part (4; 34 and 2; 32, respectively).

6. The toothbrush as claimed in ^{claim 1} ~~one of claims 1 to 5~~, wherein the first molded part (2; 32), having the brush head (3), consists of polypropylene and the other, second molded part (4; 34) consists of styrene acrylonitrile.

7. The toothbrush as claimed in ^{claim 1} ~~one of claims 1 to 5~~, wherein the first molded part (2; 32), having the brush head (3), ^{is selected from the group consisting of} ~~consists of~~ polypropylene and the other, second molded part (4; 34) consists of acrylonitrile-butadiene styrene ^{and} ~~or~~ polyamide ^{and} ~~or~~ polycarbonate or polyester.

8. A method of producing a toothbrush as ~~claimed~~ ^{comprising the step of injection molding} ~~in one of claims 1 to 7~~ by means of injection molding, wherein one of the molded parts (2; 32 or 4; 34) ~~is injection-molded from a first plastic material (A or B) in a first step and the other molded part (4; 34 or 2; 32) is subsequently injection-molded from a second plastic material (B or A), which does not bond with the first plastic material during the injection-molding operation, in a second step, so that the one molded part (2; 32) is at least partially enclosed by the other molded part (4; 34) in the manner of a shrink fit.~~ ^{subsequently injection molding}

9. The method as claimed in claim 8, wherein, with a different degree of shrinkage of the two plastic materials (A, B) intended for the molded parts (2, 4; 32, 34), that molded part (4; 34 or 2; 32) which is produced from the plastic material (A or B) with the lower degree of shrinkage is injection-molded in the first step.

10. The method as claimed in ^{claim 8} ~~one of claims 8 or 9~~, wherein the molded part (4; 34) forming at least part (6) of a toothbrush handle is injection-molded from styrene acrylonitrile in a first step and the molded

WO 00/34022

PCT/CH99/00586

- 15 -

part (2; 32) bearing the brush head (3) is subsequently injection-molded from polypropylene in a second step.